Targeting cancer stem cells with nanoparticle RNAi delivery to prevent recurrence and metastasis of ovarian cancer

Grant Award Details

Targeting cancer stem cells with nanoparticle RNAi delivery to prevent recurrence and metastasis of ovarian cancer

Grant Type:	Inception - Discovery Stage Research Projects
Grant Number:	DISC1-10588
Project Objective:	Test a hypothesis that RNAi factors delivered by nanoparticles can restore let-7 or deplete Snail and/or Twist expression, thereby disrupting cancer stem cells in ovarian cancer, resulting in reversal of chemoresistance, decreased metastasis, and prolonged survival

Investigator:		
	Name:	Julia Unternaehrer-Hamm
	Institution:	Loma Linda University
	Type:	PI

Disease Focus:	Solid Tumor, Cancer
Award Value:	$172,870
Status:	Pre-Active

Grant Application Details

Application Title:	Targeting cancer stem cells with nanoparticle RNAi delivery to prevent recurrence and metastasis of ovarian cancer

Public Abstract:

Research Objective

Our objective is to develop novel treatments for women with ovarian cancer, specifically treatments that target stem cells to reverse drug resistance. These will treat recurrent metastatic disease.

Impact

We aim to use nanoparticles to make ovarian cancer stem cells more drug sensitive, less invasive, and less likely to regrow tumors and metastasize.

Major Proposed Activities

- Nanoparticles that can switch off genes that produce cancer stem cells will be tested to determine if they are an effective treatment for ovarian cancer.
- We will use several cancer stem cell-associated proteins to deliver the nanoparticles precisely to the tumor. The most effective one will be advanced.
- In our mouse model (human ovarian cancer cells growing in the ovaries of mice) we will compare standard chemotherapy with the nanoparticle therapy for effect on tumor size and spread.
- We will identify genes that are turned on and off to produce ovarian cancer stem cells and the particular effect these genes have on how the cancer stem cells function.
- By studying which genes are active with each candidate therapy, we will understand how they affect cells, define which one pinpoints the stem cells best, and discover other potential targets to study.

Statement of Benefit to California: In California, there were 2310 ovarian cancer diagnoses, and 1530 deaths, in 2014. Over 70% of diagnosed ovarian cancers will recur and those that do, rarely respond to treatment. Our studies will use a novel nanoparticle method to protect and deliver therapy precisely to tumors. We are targeting molecules to cancer stem cells specifically, focusing on well-established factors. Our studies will advance a new therapeutic toward clinical trials for treatment of patients with this deadly disease.